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EXAMINER	
NGUYEN, KIMBINH T	
ART UNIT	**PAPER NUMBER**
2671	

DATE MAILED: 03/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/865,990	GRITZ ET AL.
	Examiner	**Art Unit**
	Kimbinh T. Nguyen	2671

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-81 and 83-133* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *6,14-17,36,38-54 and 68-81* is/are allowed.

6)☒ Claim(s) *1-5,7-13,18-35,37,55-67,83-133* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to amendment filed 11/22/2005.

2. Claims 1-81 and 83-133 are pending in the application.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-13, 18-23, 37, 55-65, 83-91, 114, 116-121, 125-133 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (6,700,672) in view of Cook et al. (4,897,806).

Claims 1 and 133, Jones et al discloses a method of forming a view of an object scene (column 2 lines 49-53 and fig la, #104 is the object; any time an image is generated you are also forming a view of the object), comprising: distributing a set of line samples each having an orientation (col. 5, lines 24-29; col. 6, lines 46-50), across an object scene (column 2 lines 49-56 and column 3 lines 10-15) such that the distribution of the orientations of the set of line samples is non-regular (abstract and column 6 lines 45-59 and column 8 lines 31-41). Jones et al. does not teach a non-regular; Cook et al. teaches a region of samples arranged in a non-regular (pseudo-random point sampling technique; col. 85, lines 52-54; lines 64-68) and combining the view of object scene along each line sample in the set of the samples to form a view of the object scene (col. 10, lines 25-34; col. 85, lines 40-42). It would have been obvious

to one of ordinary skill in the art at the time the invention was made to incorporate a non-regular grid (e.g. pseudo random) fashion taught by Cook into the line samples of Jones for filtering a sample positions, because it would improve the realism of the resulting video image frames of an object scene (col. 1, lines 50-54).

Claim 2, Jones et al discloses further comprising transforming an object in the object scene from a three-dimensional representation to a two-dimensional representation (column 2 lines 49-56, generating an image on a display from an object is always going from the 3D object to the 2D display).

Claim 3, Jones et al discloses wherein the distributing step includes projecting objects in the object scene onto an image plane (column 2 lines 49-52, when you generate an image of an object you are projecting it onto a 2D view plane; positioning the set of line samples on the image plane (column 2 lines 49-52 and column 6 lines 45-50, the line sample is oriented with the pixel which is on the plane).

Claim 4, Jones et al discloses selecting an orientation for a line sample from the set of line samples (column 6 lines 45-50), and choosing a plane for the line sample, whereby the line sample passes through the chosen plane with the selected orientation (column 6 lines 45-50 and 5g 1b).

Claim 5, Jones et al discloses wherein the orientation is greater than or equal to zero-degrees and less than one hundred and eighty-degrees (fig 1a).

Claims 7, 37, the rationale provided in the rejections of claims 1 and 4 are incorporated herein. In addition, Cook et al. teaches the orientation is selected by reference to a pseudo-random sequence of numbers (col. 1, lines 60-67). It would have

been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a pseudo random function taught by Cook into the line samples of Jones for filtering a sample positions, because it would reduce or eliminate the undesirable aliasing, both spatially and temporally and also increase realism (col. 2, lines 1-2).

Claim 8, the rationale provided in the rejection of claims 1 and 4 are incorporated herein. In addition, Jones teaches the plane passes through a central position within a region of the object scene (col. 5, lines 34-36; col. 6, lines 38-40).

Claim 9, the rationale provided in the rejection of claims 1 and 4 are incorporated herein. In addition, Jones teaches selecting a translation amount (a line sample 600 is centered on a pixel 603, and oriented parallel to an edge 601 of an object 602; WCV=0); translating the line sample by reference to the translation amount (WCV=1); col. 6, lines 36-45).

Claim 10, Jones teaches the line sample is confined to an area of the object scene and the line sample is translated from a position on a perimeter of the area (figs. 3a and 3b; col. 5, lines 34-43).

Claims 11-13, 20-23, Jones teaches the position is an origin of the area (line segment 105; fig. 1a is straight and centered on the pixel; col. 4, lines 47-51); the origin is selected by reference to the orientation 9col. 4, lines 47-51); the translation amount is limited to a translation range (the WCV varies only over a very small range of distances from –2.0 to +2.0; col. 5, lines 21-23), the translation range being a function of the orientation (the line sample is straight and centered on the pixel, the orientation of the line sample is selected to be perpendicular to the edge 101; col. 4, lines 47-49) and a

size of the area (the length of the line sample 105 at least spans the diameter of the footprint 102 (col. 4, lines 50-51).

Claims 18 and 19, the rationale provided in the rejection of claims 1 and 4 are incorporated herein. In addition, Jones teaches selecting line sample an area defined by an intersection of the line sample and a region of the object scene within each line sample is positioned (col. 4, lines 8-38); selection of the area from a range of possible areas is substantially uniform; selecting an area (non-zero values; col. 4, lines 31-38).

Claim 55, Jones et al discloses isolating a segment of the line sample that overlaps an object (fig 3a); and calculating a distance of the object from the segment (fig 3a, d1, column 5 lines 30-43).

Claim 56, Jones et al. discloses calculating a distance between a first end of the line sample (col. 5, lines 30-43; figs. 3a, 3b) and a translation on the line sample from not overlapping the object to overlapping (from no coverage to full coverage; col. 6, lines), wherein a first end coordinate of the segment is derived from the distance (col. 6, lines 37-45; col. 8, lines 17-23).

Claim 57, Jones et al. discloses calculating a distance between a first end of the line sample (col. 5, lines 30-43; figs. 3a, 3b) and a translation on the line sample from overlapping the object to not overlapping (from full coverage (the line sample is entirely within the object) to no coverage (the line sample is completely outside the object); col. 7, lines 3-9), wherein a first end coordinate of the segment is derived from the distance (col. 6, lines 37-45; col. 8, lines 17-23).

Claims 58-60, Jones et al. teaches a first end point coordinate of the segment is set to zero (col. 4, lines 60-61) if a first end of the line sample overlaps the object (full coverage; col. 5, line 1); maintaining object data in relation to the segment (col. 3, lines 31-56).

Claim 61, Jones et al. discloses the object data includes a color value of the object (a weighted coverage value and colors associated with that pixel and combined to produce the final color for the pixel in the image; col. 2, lines 28-30).

Claims 62 and 63, Jones et al. discloses the object data includes the distance (col. 2, lines 57-59), a transparency value of the object (weighted coverage value; col. 2, lines 60-63).

Claim 64, Jones et al discloses wherein the distance is calculated from a first end of the segment (5g.3a, d2).

Claim 65, Jones et al. discloses further comprising calculating a second distance of the object from the segment, wherein the second distance is calculated from a second end of the segment (fig 3a, d1).

Claim 83, Jones et al. teaches identifying a portion of the line sample overlapping a set of objects (the line sample 702 is entirely within the object 700; col. 7; lines 8-9); computing a color value (col. 2, lines 22-29).

Claims 84-86, Cook et al. discloses the set of objects include a transparent object (col. 87, lines 45-50) ; an opaque object (the translucent object; col. 10, lines 15-17); the set of objects include one or more objects (col. 84, lines 47-50).

Claim 87, Jones et al. teaches sorting the segments by reference to a distance from the line sample (a segment 320; col. 5, lines 45-49).

Claims 88-90, Jones et al. discloses a first position on the line sample that marks a beginning of an overlap of objects (endpoint e1 305; fig. 3a); a second position on the line sample that marks an event affecting the computing (endpoint e2 306; fig. 3a); the portion of objects that the line sample overlaps between the first and second position as a set of object (col. 5, lines 31-56; figs 3a-3f).

Claim 91, Jones et al. discloses the event marks an intersection between objects that the line sample overlap (col. 5, lines 46-49).

Claims 114 and 125, Jones et al discloses wherein characteristic information of each pixel is determined by line sampling object scene data (column 3 lines 10-15), wherein a line sample is oriented within a boundary of each pixel (figs. 3a-3f) in a non-regular pattern. Jones et al. does not teach a non-regular; Cook et al. teaches a region of samples arranged in a non-regular (see the rejection of claim 1).

Claims 116 and 117, the rationale provided in the rejection of claim 1 is incorporated herein. In addition, Cook et al. discloses an aperture size and a focal plane to objects in an object scene (col. 85, lines 18-20); and Jones et al. teaches positioning a set of line samples across an object scene (fig. 7b). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the aperture size and focal plane, non-regular pattern taught by Cook into the line samples of Jones, because it would maximize the realism of the resulting image frames (col. 9, lines 43-44).

Claim 118, Cook et al. teaches forming a video image frame (col. 85, lines 3-6); the position selected by reference to a non-regular sequence of numbers (see the rejection of claim 1); the characteristic information of each pixel is further determined by point sampling of the object scene (col. 85, lines 7-17).

Claim 119, Jones et al discloses a method for line sampling image data in a computer system for determining characteristic information of a pixel (column 3 lines 10-15), comprising: defining a plurality of sample areas comprising at least a portion of a pixel (column 3 lines 10-15); selecting line sample positions within said areas such that the distribution of line samples is non-regular (see the rejection of claim 1); and combining characteristic information of the line samples in the pixel, thereby to determine characteristic information of the pixel (column 3 lines 10-15).

Claim 120, the rationale provided in the rejection of claims 118 and 119 is incorporated herein because defining non-overlapping portions (visible portions of a pixel) are the same as defining sample areas comprising at least a portion of a pixel.

Claim 121, the rationale provided in the rejection of claim 1 is incorporated herein. In addition, Cook et al. discloses spatial distribution across the video image frame (col. 7, lines 3-30); temporal distribution within a time period associated with the video image frame (col. 8, lines 50-68). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate distribution of a spatially periodic sampling pattern taught by Cook into the line samples of Jones for producing video image frame, because it would reduce or eliminate the undesirable aliasing, both

spatially and temporally, increase the realism of the video frame (col. 1, line 67 through col. 2, line 5).

Claim 126, the rationale provided in the rejection of claim 121 is incorporated herein.

Claim 127, the rationale provided in the rejection of claim 116 is incorporated herein.

Claim 128, the rationale provided in the rejection of claim 117 is incorporated herein.

Claim 129, Jones et al discloses a computer program product for use in conjunction with a computer system (column 1 lines 10-15), the computer program product comprising a computer readable storage medium and a computer program mechanism embedded therein, the computer program mechanism comprising instructions for forming a video image frame that specifies characteristic information of each pixel of an array of pixels that forms the video image frame (column 3 lines 10-15), wherein the instructions determine characteristic information of each pixel by line sampling object scene data at a position within a boundary of each of said pixels (column 3 lines 10-15) and by point sampling object scene data at a position within the boundary of each of said pixels (column 3 lines 65-67 and column 4 lines 1-7).

Claim 130, Jones et al discloses a computer program product for use in conjunction with a computer system (column 1 lines 10-15), the computer program product comprising a computer readable storage medium and a computer program

mechanism embedded therein, the computer program mechanism comprising: instructions for defining a plurality of sample areas comprising at least a portion of a pixel (column 3 lines 65-67 and column 4 lines 1-8); instruction for selecting line sample positions within said areas such that the distribution of line samples is non-regular (see the rejection of claims 114 and 125 above); and instructions for combining characteristic information of the line samples in the pixel, thereby to determine characteristic information of the pixel (column 3 lines 10-15).

Claims 131-133, the rationale provided in the rejection of claims 1, 120 and 121 is incorporated herein.

5. Claims 92-108 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (6,700,672) in view of Cook et al. (4,897,806), and further in view of Deering et al. (6,577,312).

Claims 92-94, Deering et al. discloses computing a color value for the line sample by reference to a color value computed for one or more the sets of objects (col. 1, lines 39-59; col. 30, lines 22-45); a contribution of objects to the color value for the line sample is a function of a length of the portion of the line sample overlapping objects (col. 19, lines 37-56); selecting a number of positions along the line sample (col. 15, lines 15, lines 43-45); combining the color valued computed for positions along the line sample, whereby a color value for a line sample is calculated (col. 15, lines 45-48; col. 23, lines 29-39). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate calculating color information taught by Deering into the line samples of Jones for combining the calculated color information along the

position of sample, because it would create more realistic final image (col. 1, lines 58-59).

Claims 95-102, Jones does not teach a subset of line samples; however, Deering teaches subset of the plurality of samples (col. 44, lines 25-29); computing a color value for the subset of samples (a sample color value; col. 44, lines 26-39); the color value is assigned to a pixel (col. 2, lines 52-55); the subset of lines samples is distributed within a region of the object scene (col. 45, lines 57-60); the regions comprises a pixel; a set of pixels (col. 45, lines 7-9); assigning a weight to a sample in the subset, the weight affecting a contribution of the line sample to the color value (weighted sample attribute; col. 44, lines 30-38; the sample attribute of each sample in the subset is a sample color value; col. 46, lines 66-67); wherein the weight is a function of a distance of a sample from a center position of the pixel on the object (col. 3, lines 39-41). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the subset is a sample color value taught by Deering into the line samples of Jones for determining filter coefficient for a subset of the samples, because the it would create a more realistic final image (col. 1, lines 68-69).

Claims 103-106, Jones et al. discloses the weight of a line sample is a function of length of the line sample (col. 9, lines 21-23); the length of the line sample is determined by reference to a portion of the line sample for which a color value is defined (col. 7, lines 20-34); the weight is reduced by an amount proportional to an amount the line sample is shorter than a maximum line sample length (the weighted coverage values

are in the range 0.0 to 1.0); the maximum line sample length is a maximum distance across a pixel (col. 4, line 64 through col. 5, line 9).

Claims 107 and 108, Deering et al. teaches selecting a set of points across the object scene such that the points form a regular pattern (col. 14, lines 2-7); interpolating (filtering) the view objects in an object scene along each line sample in the set of line samples at each point in the set of points (col. 33, line 66 through col. 34, line 9); extrapolating the view of objects (the filter may be inversely proportional to the density of the samples in that region; col. 43, lines 59-61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate interpolating scheme taught by Deering into the line samples of Jones for combining or filter coefficients summations, because applying variety interpolation schemes it would provide more accurately estimate filter coefficient for sample radii intermediate (col. 34, lines 7-8).

6. Claims 109-111, 122 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deering et al. (6,577,312) in view of Jones et al. (6,700,672).

Claims 109-111 and 122, Deering et al. teaches subdividing an object scene to form a grid (fig. 8); Jones et al. discloses positioning a line sample in each cell of the grid (fig. 11a); orienting the line sample by reference to a non-regular sequence of numbers (see the rejection of claim 1 above); translating the line sample within the cell such that an intersection of the line sample and the grid form an area (line sample 1205 is oriented perpendicularly to the direction of the tangent 1202; col. 8, lines 40-41; fig. 12); determining the object scene along the line sample in each cell of the grid (col. 8,

lines 35-38). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the properly oriented line samples taught by Jones into the non-regular grid of Deering for determining the object scene along the line sample, because it would produce the weighted coverage values is used to generate an anti-aliased discrete image (col. 8, lines 47-50).

7. Claims 112, 113, 123, 124 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (6,700,672).

Claims 112 and 123, Jones et al discloses a method of sampling object scene data (column 2 lines 49-57), comprising: distributing a set of line samples across an image plane such that the distribution of the line samples is non-regular (see the rejection of claim 1 above); projecting objects defined in object scene data onto the image plane (column 2 lines 49-57, anytime time you generate an image form object data you are projecting the image onto a 2D viewing plane, the display). However, Jones et al does not specifically disclose computing a view of objects each line sample in the set of line samples overlap; and combining the view of objects each line sample overlaps. This would have been obvious to one of ordinal skill in the art at the time the invention was made because generating when you generate an image you are also forming a view of the image from the object and this view is dependent on the view of each sample used. You have to know the view in order to generate the image. Jones discloses in column 3 lines 11-15 using multiple line samples for each pixel and weighted coverage values of the line samples are combined to produce a combined weighted coverage value which is associated with the pixel.

Claims 113 and 124, this claim is similar to claims 112 and 123 as seen above and thus rejection is the same as for claim 112. The defining an array of pixels from object scene data and using the line samples for scene data is disclosed in the abstract.

8. Claim 115 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cook et al. (4,897,806).

Claim 115, Cook et al. discloses forming a video image frame that specifies characteristic information of pixel of an array pixels (col. 87, lines 8-11), wherein the characteristic information is determined by line sampling object scene data (col. 87, lines 11-15), wherein the object scene data includes information about changes in an object scene occur during a time period of the video image frame (col. 87, lines 15-28), wherein a line sample is oriented within each pixel and distribute within the time period by reference to a non-regular sequence of numbers (col. 85, lines 52-54), whereby any motion blur of the object scene is included in the video image frame (col. 87, lines 29-30). Cook uses point sampling for forming a video image frame; however, Jones et al. teaches "if the line sample and the edge are oriented parallel to each other, then the line sample acts as a single point sample as shown in figs. 6a and 6b", (col. 6, lines 36-37); therefore it would have been obvious to one ordinary skill in the art at the invention was made to incorporate the line samples taught by Jones into the pseudo random point sampling of Cook for forming a video image frame, because line sampling can be used for calculating weighted coverage values from shape information and can be combined with area sampling, it would produce high quality anti-aliased images (col. 4, lines 1-7).

Allowable Subject Matter

9. Claims 6, 14-17, 36, 38-54, 66-81 allowed.

Response to Arguments

10. Applicant's arguments filed 11/22/05 have been fully considered but they are not persuasive., because Deering and Cook show the distribution of the set of the sample is non-regular (effects of illumination, shadow object reflection and object refraction are made more realistic by causing each sample point to pseudo-randomly (non-regular) select one of a predetermined number of possible ray directions or orientations; Cook (see abstract)); therefore, the rejection of claims 1-5, 7-13, 1-35, 37, 55-65, 83-133 is maintained.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimbinh T. Nguyen whose telephone number is (571) 272-7644. The examiner can normally be reached on Monday to Thursday from 7:00 AM to 4:30 PM. The examiner can also be reached on alternate Friday from 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached at (571) 272-7664. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 16, 2006

KIMBINH T. NGUYEN
PRIMARY EXAMINER